

CLAIMS

1. An electric element built-in module comprising:
a wiring pattern;
5 at least two electric elements mounted on the wiring pattern; and
a thermosetting resin composition for sealing the electric elements;
wherein upper surfaces of the at least two electric elements and an
upper surface of the thermosetting resin composition are substantially flush
with each other.
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2. The electric element built-in module according to claim 1, wherein at
least one of the electric elements comprises a functional portion and a
connection electrode on a surface on a side of the wiring pattern, and the
connection electrode is connected to the wiring pattern.
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3. The electric element built-in module according to claim 1, wherein at
least one of the electric elements is at least one element selected from the
group consisting of a semiconductor chip, a chip resistor, a chip capacitor and
a chip inductor.
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4. The electric element built-in module according to claim 1, wherein at
least one of the electric elements is a surface acoustic wave device.
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5. The electric element built-in module according to claim 4, wherein a
surface of the surface acoustic wave device on the side of the wiring pattern is
provided with a functional portion and a space holding structure for
preventing excitation and propagation of a surface elastic wave from being
obstructed in the functional portion.
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6. The electric element built-in module according to claim 5, wherein the
space holding structure is formed of a film-like resin composition.
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7. The electric element built-in module according to claim 1, wherein the
upper surfaces of the at least two electric elements and the upper surface of
the thermosetting resin composition that are substantially flush with each
other both have a surface roughness Rz of 0.5 to 50 μm .

8. The electric element built-in module according to claim 1, wherein the thermosetting resin composition contains an inorganic filler and a thermosetting resin.

5 9. The electric element built-in module according to claim 8, wherein the thermosetting resin contains an epoxy resin, a phenolic resin or a cyanate resin as a main component.

10. 10. The electric element built-in module according to claim 8, wherein the inorganic filler is at least one inorganic filler selected from the group consisting of Al_2O_3 , MgO , BN , AlN and SiO_2 .

11. 11. The electric element built-in module according to claim 1, wherein the wiring pattern is formed on a surface of a circuit board.

15 12. The electric element built-in module according to claim 1, wherein the wiring pattern is formed on a surface of a support.

20 13. The electric element built-in module according to claim 12, wherein the support is formed of an organic film or a metal foil.

14. 14. The electric element built-in module according to claim 1, wherein at least one of the electric elements is connected to the wiring pattern via a bump.

25 15. A method for manufacturing an electric element built-in module comprising:

mounting at least one electric element, one of whose surface is provided with a functional portion and a connection electrode, on a wiring pattern so that the one surface faces the wiring pattern;

30 sealing the electric element with a thermosetting resin composition from a side of the other surface of the electric element; and

grinding or abrading the electric element sealed with the thermosetting resin composition from the side of the other surface of the electric element.

35 16. The method for manufacturing the electric element built-in module

according to claim 15, wherein a bump is formed on the connection electrode of the electric element, and the electric element is mounted on the wiring pattern using the bump and an electrically conductive adhesive.

5 17. The method for manufacturing the electric element built-in module according to claim 15, wherein a bump is formed on the connection electrode of the electric element, and the electric element is mounted on the wiring pattern using the bump and a sheet in which an electrically conductive filler is dispersed.

10 18. The method for manufacturing the electric element built-in module according to claim 15, wherein a bump is formed on the connection electrode of the electric element, and the electric element is mounted on the wiring pattern by connecting the bump and the wiring pattern in an ultrasonic manner.

15 19. The method for manufacturing the electric element built-in module according to claim 15, further comprising filling and curing a resin between the electric element and the wiring pattern, after mounting the electric element on the wiring pattern and before sealing the electric element with the thermosetting resin composition.

20 20. The method for manufacturing the electric element built-in module according to claim 15, wherein the electric element is sealed with the thermosetting resin composition by overlaying an uncured sheet-like object formed of the thermosetting resin composition onto the other surface of the electric element, followed by heating and compression.

25 21. The method for manufacturing the electric element built-in module according to claim 15, wherein the electric element is sealed with the thermosetting resin composition by applying an uncured paste-like object formed of the thermosetting resin composition from the other surface of the electric element under a vacuum or a reduced pressure, followed by heating.

30 22. The method for manufacturing the electric element built-in module according to claim 21, wherein the heating is carried out at an atmospheric pressure or larger.

23. The method for manufacturing the electric element built-in module according to claim 20 or 21, wherein the thermosetting resin composition contains at least a thermosetting resin, and a temperature of the heating is
5 equal to or lower than a cure starting temperature of the thermosetting resin.

24. The method for manufacturing the electric element built-in module according to claim 15, wherein the thermosetting resin composition contains at least 70wt% to 95wt% of an inorganic filler and 5wt% to 30wt% of a
10 thermosetting resin.

25. The method for manufacturing the electric element built-in module according to claim 15, further comprising making a division into a desired shape, after grinding or abrading the electric element sealed with the
15 thermosetting resin composition.

26. The method for manufacturing the electric element built-in module according to claim 15, wherein the wiring pattern is formed on a surface of a circuit board.
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27. The method for manufacturing the electric element built-in module according to claim 15, wherein the wiring pattern is formed on a surface of a support.

25 28. The method for manufacturing the electric element built-in module according to claim 27, wherein the support is formed of an organic film or a metal foil.

29. The method for manufacturing the electric element built-in module
30 according to claim 27, further comprising peeling off the support, after grinding or abrading the electric element sealed with the thermosetting resin composition.

30. The method for manufacturing the electric element built-in module according to claim 29, further comprising, after peeling off the support,
35 forming a wiring pattern by laminating a prepreg for a circuit board provided with a through hole in a thickness direction filled with an electrically

conductive paste and a metal foil in this order on a surface on a side of the wiring pattern exposed by the peeling, followed by heating and compression, and then etching the metal foil.

- 5 31. The method for manufacturing the electric element built-in module according to claim 27, further comprising, after sealing the electric element with the thermosetting resin composition and before grinding or abrading the electric element sealed with the thermosetting resin composition, peeling off the support, and
- 10 forming a wiring pattern by laminating a prepreg for a circuit board provided with a through hole in a thickness direction filled with an electrically conductive paste and a metal foil in this order on a surface on a side of the wiring pattern exposed by the peeling, followed by heating and compression, and then etching the metal foil.
- 15 32. The method for manufacturing the electric element built-in module according to claim 30 or 31, further comprising, after forming the wiring pattern by etching the metal foil, forming at least one second wiring pattern by laminating a prepreg for a circuit board provided with a through hole in a thickness direction filled with an electrically conductive paste and a second metal foil in this order on a surface on a side of the wiring pattern obtained by the etching, followed by heating and compression, and then etching the second metal foil.
- 20 33. The method for manufacturing the electric element built-in module according to claim 15, wherein the electric element and the thermosetting resin composition are ground or abraded at the same time so as to be substantially flush with each other.
- 25 34. The method for manufacturing the electric element built-in module according to claim 15, wherein the grinding or abrading is carried out by an abrading method using an abrasive.